



INTELLIGENCE REPORT

USSR: ABOUT TO ENTER THE AUTOMOTIVE AGE?

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USSR: ABOUT TO ENTER THE AUTOMOTIVE AGE?

SUMMARY

The widely publicized Soviet decision to boost production of automobiles* brings the USSR one step nearer the automotive age. However, announced plans are not so grandiose as to require a significant alteration in traditional Soviet economic priorities, and would leave military and space programs unimpaired. Even with the usual slip-page in Soviet construction plans, output of automobiles probably could accelerate to 460,000 by 1970 and to 1.1 million by 1975. This would provide the Soviet Union with an automobile stock roughly equal to that of the United States in 1917, and, on a per capita basis, about 5 percent of the current US inventory. Perspective can be gained by projecting Soviet per capita availabilities to 1975 and comparing them with the inventories that already exist in Western European countries; in each case, the Soviet expectation is a small fraction of the realized Western level.

Essentially, the new Soviet program is designed to produce automobiles for the bureaucratic and managerial elite, not for the average citizen. By the early 1970's, perhaps half of the automobiles produced will be available for public purchase, rather than for government use. It seems certain that, within the next decade at least, the Soviet leadership not only has no plans to mass produce automobiles in imitation of the West, but would strenuously resist internal pressure to do so. Although the USSR may some day join the circle of nations that provide automobiles for the average citizen, that day is not now in sight.

Direct investment needed to fill the present Soviet program will be about \$1.2 billion,** of which \$800 million is planned for the construction of a Fiat automobile plant in the USSR. The French firm of Renault may play a role in reconstructing the present Moskvich plant; other facilities will be expanded by the USSR itself. Through 1970,

* The term *automobile* as used throughout this report refers to passenger automobiles; the term *motor vehicles* includes not only automobiles but also trucks and buses.

** Expressed in current US dollars, unless otherwise indicated.

the investment will represent less than $\frac{1}{2}$ of 1 percent of all Soviet investment in industry and 4 to 5 percent of machine building investment. Even these data overstate the burden, for repayment on the Fiat contract will stretch well into the 1970's.

Indirect investment required for the supporting facilities for the production of steel, gasoline, and tires has not been fully calculated, but appears to be on the order of \$400 million—substantially less than the direct investment.

So-called tertiary investment—in highways, gasoline stations and service facilities, motels, and the like—also needs to be added to the bill. An examination of Soviet plans for highway development during the next five years reveals that these call for only a modest increase over the previous five years—about 20 percent in terms of kilometers, or an expenditure of about \$1.2 billion a year. Road density in the USSR by 1975 will be considerably below that of most Western European countries and the United States. Furthermore, Western experience demonstrates that for several decades after a country begins the acceleration of automobile production, the tempo of supporting investments increases only slowly. Not until there is a large, widely distributed stock of automobiles does a rapid acceleration take place.

Some amelioration in the Spartan level of service and maintenance facilities will be needed. At present, there are only eight gasoline stations and eight garages in Moscow. If the Soviet regime increases the number of such facilities at the same rate as in the past, the cost by 1975 would be about \$175 million. The lack of adequate maintenance facilities is reflected in the fact that approximately one-fifth of the automobiles in the Soviet motor inventory are normally out of service, awaiting repairs.

I. Plans and Feasibility

For production of automobiles, the Soviet five-year plan (1966-70) implies an average annual rate of increase of 28 to 32 percent in contrast to the rate of 7.7 percent achieved during the past five years (1961-65). For the first time, a Soviet plan calls for a greater output of automobiles than trucks, as shown in the following tabulation.

	Production (Thousand Units)	
	1965	1970 Plan
Automobiles	201.2	700 to 800
Trucks	379.6	600 to 650
Buses	35.6	60
<i>Total</i>	<i>616.4</i>	<i>1,360 to 1,510</i>

Although the USSR appears ready to commit more investment to the automobile branch of the motor vehicle industry, it seems unlikely that the 1970 goal of 700,000 to 800,000 automobiles will be reached before 1972 (see Table 1).

The plant to be built in the USSR by the Fiat company will be capable of producing 600,000 automobiles a year when operating at capacity and will be the single most important source of increased production of automobiles. (For the schedule of the Fiat plant, see the chart, Figure 1.) Other significant output increases could come from a planned modernization of the Moskvich automobile plant in Moscow, from a new automobile plant at Izhevsk that is to begin

Table 1

Estimated Production of Automobiles in the USSR *
1966-75

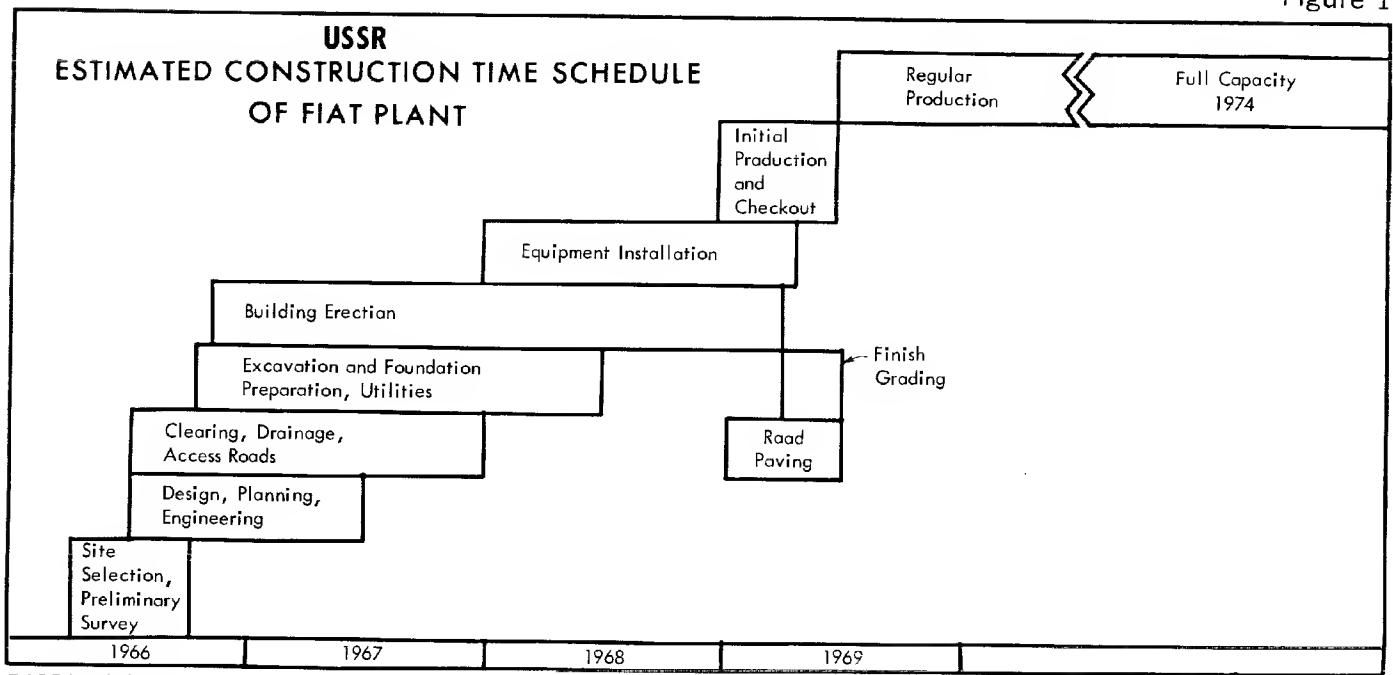
MODEL	Thousand Units									
	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
Volga	56	58	60	63	66	70	75	80	85	90
Moskvich	74	83	88	90	100	120	140	160	180	200
Zaporozhets	48	57	67	76	84	90	95	100	100	100
Izhevsk	0	8	30	50	80	100	100	100	100	100
Fiat	0	0	0	5	100	250	400	500	600	600
GAZ 69 ^b	28	28	28	28	28	28	28	28	28	28
<i>Total</i> °	<i>210</i>	<i>230</i>	<i>270</i>	<i>310</i>	<i>460</i>	<i>660</i>	<i>840</i>	<i>970</i>	<i>1,100</i>	<i>1,100</i>

* Based on a study of the past performance of the Soviet automobile industry, the current five-year plan for the industry, recent press announcements, and a study of the individual automobile plants. Data are rounded to two significant digits. Because of rounding, components may not add to the totals shown.

^b A jeep type of vehicle.

° Including production of 100 ZIL-111's and 200 Chaika's per year.

Figure 1



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production of the Moskvich 408 later this year, and from the planned modernization of the Gor'kiy motor vehicle plant.

There are several reasons for estimating that the USSR will not achieve its 1970 goal for automobile production. It is well documented that Western builders experience long delays when working in the Soviet bureaucratic and technical environment. The Fiat plant is not expected to be completed until mid-1969 and will probably not be producing at capacity until 1974. In addition, the modernization and expansion of present automobile plants and the start of production at Izhevsk is not likely to move with the speed necessary to achieve the 1970 goal—Soviet planners have always been slow in starting new production. Finally, extensive renovation of the Moskvich plant will cause protracted disruptions in production.

II. The Automobile in Soviet Society

The USSR has only a toehold in the automotive age. Steady increases in Soviet automobile production in the last decade boosted output to 201,200 units in 1965, but judged in relation to demand in the USSR as well as production in other industrially advanced countries, such a level of output is minuscule. The production and inventory of automobiles in the USSR in comparison to other selected countries is shown in Table 2. (For models of Soviet automobiles, see Figure 2.)

The small size of the automobile industry in the USSR is clearly the result of calculated neglect by Soviet policymakers, both under Stalin and later under Khrushchev. Indeed, Khrushchev was fond of pointing out that the mass production and distribution of automobiles was a "weakness" of capitalism which the USSR had no intention of emulating. Instead, he advocated the establishment of rental-car services in the major cities—a policy that has worked very poorly in the few cases where it has been tried.

Khrushchev's attitude undoubtedly stemmed in large part from a conviction that the USSR could not afford to provide its people with automobiles if it was to meet priority commitments in the development of heavy industry, military weaponry, and space technology. Noneconomic explanations for this neglect were probably equally im-

Table 2
Production and Stock of Automobiles in Selected Countries
1964

	Production	Stock of Automobiles ^a	Automobiles per Million Population ^b
Argentina	114,617	800,000	36,400
Australia	340,614	2,599,000	234,000
Belgium	327,899	201,000	21,400
Canada	560,678	5,122,000	265,000
France	1,390,312	7,960,000	164,000
Italy	1,028,930	4,632,000	90,600
Japan	579,660	1,672,000	17,300
South Africa	143,373	1,023,000	58,500
Spain	119,000	652,000	20,800
Sweden	160,106	1,666,000	217,000
United Kingdom ...	1,867,640	8,436,000	156,000
United States	7,745,492	71,950,000	375,000
USSR	185,200	919,000	4,000
West Germany	2,650,183	8,100,000	144,000

^a Based on automobile registrations, except for Soviet data, which are estimated.

^b Based on midyear population.

MODELS OF SOVIET AUTOMOBILES

Figure 2



VOLGA- Largest car available to the public; retail price \$6,000 plus.



ZAPOROZHETS- Smallest and most unpopular Soviet car; retail price about \$1,500.



MOSKVICH 408- Popular model of the Moskvich line; retail price about \$5,000



FIAT 124- Comparable to the Moskvich 408; a likely choice for the Fiat plant.

ZIL III



CHAIKA

Prestigious models produced in limited quantities

exclusively for the Soviet elite; no quoted prices

portant to Khrushchev—for example, the problems of political control and the potential dangers of sociological changes that have been considered anathema to the Communist leadership.

Kosygin's views on the automobile are not revolutionary but suggest some catering to the bureaucratic elite and to the aspirations of Soviet consumers in the upper middle class. This does not mean a program that will lead to an automobile for every Soviet family. Kosygin's speech to a meeting of the State Planning Committee on 19 March 1965 is the most complete statement thus far issued from Moscow on the reasons behind the plan to boost automobile production:

You know how staunchly the idea was imposed that there was no necessity in our country to develop the production of passenger automobiles on a large scale. Let all people ride only in buses, so to speak. Everything has been done to deprive even the leaders of big enterprises and economic organizations of the right to use passenger cars. Is this correct? The result has been that many leaders have been compelled to use trucks unlawfully for their official rides. An apparent saving was made on transport costs, but in fact damage was inflicted on our economy.

The plans thus far released by the Soviet leader appear to confirm the viewpoint implicit in this quotation. In 1965 there were 4,350 automobiles per million population; it is estimated that there will be about 7,000 by 1970 and about 17,000 by 1975. The Soviet inventory in 1975 would be about equal to that in the United States in 1917. On a per capita basis of comparison, this 1975 Soviet achievement would be about 5 percent of current US inventory levels. The restricted nature of the automobile plan can also be seen from the fact that, at present, Italy, with a per capita gross national product (GNP) of less than \$1,200, provides one automobile for every 10 persons. In comparison, by 1975 the USSR, even with a projected per capita GNP of \$1,900, will provide only one car for every 60 persons.

III. Automobiles on the Road, 1966-75

At present, the Soviet inventory of automobiles, publicly and privately owned, is estimated to be about 1 million automobiles (see Table 3). By 1970, the inventory probably will be 1.7 million. Despite the planned increase in numbers of automobiles by 1975, few Soviet citizens will have their own. A large share of total production per year will continue to go for official use—that is, publicly owned cars operated by administrative personnel, factory managers, the military, and taxi services (see Table 4). Approximately one-fifth of the inventory is normally out of service, awaiting repairs.

Table 3
Estimated Stock of Automobiles in the USSR *
1966-75

	Thousand Units									
	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
Starting inventory	1,000	1,100	1,200	1,300	1,400	1,700	2,100	2,500	3,100	3,700
Production	210	230	270	310	460	660	840	970	1,100	1,100
Exports ^b	47	54	63	72	110	150	190	220	250	260
Imports ^c	2	2	2	2	2	2	2	2	2	2
Scrappage ^d	80	87	94	100	110	130	160	200	250	290
Year-end inventory	1,100	1,200	1,300	1,400	1,700	2,100	2,500	3,100	3,700	4,200

* Data are rounded to two significant digits. Because of rounding, components may not agree with the totals shown.

^b Assumed to be constant at 23 percent of production—the same level as 1961-64.

^c Assumed to be constant at 2,000 units.

^d Assumed to be constant at 8 percent of the starting inventory.

Table 4
Estimated Number of Newly Produced Automobiles
Available for Private Use in the USSR *
1966-75

	Thousand Units									
	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
Production	210	230	270	310	460	660	840	970	1,100	1,100
Exports ^b	47	54	63	72	110	150	190	220	250	260
Imports ^c	2	2	2	2	2	2	2	2	2	2
Official and commercial use	77	87	100	120	160	200	230	240	240	210
Private use ^d	84	95	110	130	200	310	410	510	610	660

* Data are rounded to two significant digits. Because of rounding, components may not agree with the totals shown.

^b Assumed to be constant at 23 percent of production—the same level as 1961-64.

^c Assumed to be constant at 2,000 units.

^d For 1966-69, the number of automobiles available is assumed to be constant at 52 percent of the figure arrived at when exports and imports are netted out of production. After 1969 the percent of net production increases by 4 percentage points per year, reflecting a larger share of automobiles available to the public.

IV. Primary Investment

If the USSR is to produce 1.1 million automobiles annually by 1975 (see Table 1), approximately \$1.2 billion will have to be invested in plant buildings, equipment, and direct manufacturing support facilities. The following tabulation presents estimates of the investment needed to modernize and increase the output of the existing plants as well as to build the two new plants proposed by Soviet planners:

Plant	Production (Thousand Units)		Investment Required (Million US \$)
	1966	1975	
Gor'kiy	56.0	90	44
MZMA	74.0	200	190
Zaporozh'ye	48.0	100	78
Izhevsk (to be built)	0.1	100	130
Fiat * (to be built)	0	600	800
<i>Total</i>			<i>1,242</i>

* Tol'yatti, formerly Stavropol', on the Volga.

Approximately \$900 million of the \$1.2 billion total investment will have to be spent prior to 1970 if the estimated levels of production are to be attained by 1975. The \$900 million is about 0.5 percent of expected total Soviet investment in industry and 4 to 5 percent of total investment in machine building for 1966-70. The USSR is capable of allocating this small share of total new investment funds to the automobile industry without resorting to any significant shifts in present investment allocation plans, including those for the military or space program. The financial burden on the USSR is eased by the extended repayment terms of the Fiat agreement—terms of nine years following completion date.

Most of the total investment of \$1.2 billion needed by 1975 will go into the proposed Fiat plant. An official of a large US automobile company estimates that the total cost of direct manufacturing equipment and buildings in such a plant would be \$522 million. With supporting facilities, the total cost would probably be within the range of the \$700 million to \$800 million estimated by Fiat. Although the details of the project have not yet been finally settled, a breakdown of estimated costs of the Fiat plant and the degree of Italian, Western European, and US participation is shown in Table 5 (for the costs of specific parts of the plant, see the Appendix).

The total cost to the USSR of a fully operating automobile plant to produce 600,000 cars per year will exceed \$800 million. Training

expenses will be considerable for the 30,000 to 40,000 employees needed to operate the facility. Unless the major new plant is erected in a large city, dwellings, schools, and other facilities will have to be built. In addition, smaller investments will be required in industries supplying raw materials and semimanufactured goods directly to the automobile industry as well as in those industries supplying goods and services to automobile users.

The details of other Soviet plans to modernize and expand existing plants and to construct other new plants for the automobile industry have not yet been fully disclosed. Renault of France may sign an agreement to enlarge the dilapidated and outmoded Moskvich plant. Expanding this plant to a capacity of 200,000 automobiles per year would be tantamount to building a new plant and would cost approximately \$190 million. Renault might follow its previous practice in dealing with Communist countries and reduce costs by supplying used equipment from its French plants.

In addition, the USSR is preparing to start production of Moskvich automobiles in Izhevsk in the western Urals. This plant will require an additional investment of about \$130 million before the proposed capacity of 100,000 units can be reached. The USSR probably will also increase automobile production in its Gor'kiy and Zaporozh'ye facilities by a total of about 86,000 units per year between 1966 and 1975, requiring about \$122 million more in new investment.

Table 5

Soviet, Italian, Western European, and US Participation in the Estimated Costs of the Fiat Plant to be Constructed in the USSR

	Million US \$
Building (all to be supplied by the USSR)	167
Machinery and equipment	355
Supplied by Fiat from Italian, Western European, and US sources	255
Supplied by the USSR	100 ^a
Other supporting facilities ^b	278
Supplied by Fiat	65
Supplied by the USSR	213
Total cost of Fiat plant	800
Total supplied by the USSR	480
Total supplied by non-Soviet sources	320 ^c
Italy	195 to 235 ^d
Other Western European	40 to 90
United States	30 to 50

^a Some commentators have suggested that the USSR would supply no equipment. It is most unlikely, however, that the USSR, with the world's largest machine tool industry, would not participate in equipping such a plant.

^b Other supporting facilities include costs of external transportation connections; Fiat-supplied training, engineering, plant layout, and powerplant; and plants for paint, gaskets, nuts, bolts, radiators, and other assorted hardware.

^c Midpoint of the range.

^d Including an engineering fee of \$65 million.

V. Secondary Investment

A. INTRODUCTION

The production of from 7 million to 9 million automobiles annually in the United States affects virtually every branch of US industry. One out of every seven wage earners is connected with some phase of the automobile world. One out of every six businesses in the United States depends on the manufacture, distribution and servicing, or use of motor vehicles. Automobile, truck, and bus production in the United States in 1963 accounted for the following shares of various materials:

Material	Percent of Domestic Production
Domestically consumed steel	23
Cold rolled sheet and strip	46
Gray iron castings	19
Malleable castings	57
Natural rubber	65
Synthetic rubber	60
Nickel	14
Zinc	35

The automotive support industries—fuel, accessories, and the like—have grown rapidly in the United States and now almost equal one-half of the value of retail sales of new automobiles, as shown in the following tabulation:

	Million US \$
Automobiles	46,000
Tires, batteries, and accessories	2,900
Gasoline, repair, and maintenance	20,000
<i>Total</i>	68,900

In the USSR, in contrast, automobile production has little impact on industrial production. In 1959, total production of motor vehicles (automobiles, trucks, and buses) used less than 4 percent of the gross value of the output of ferrous metals. The share of inputs consumed by the motor vehicle industry in 1959 is shown in the following tabulation:

Material	Percent of Gross Output
Ferrous metals	3.4
Nonferrous metals	3.8
Metal products (nuts, bolts, and the like)	3.8
Glass	1.6
Bearings	11.1
Tools and instruments	1.2
Electrotechnical (generators, electric motors, batteries, and the like)	1.0

B. FERROUS METALS REQUIREMENTS

In view of planned increases in iron and steel production, automobile production will not significantly increase its claim on total Soviet output of ferrous metals through 1975 (see Table 6). The Soviet metallurgical industry, however, will have some problems in producing steel products according to specifications in all the required shapes and grades. The metallurgical industry must supply the automotive industry with substantially increased quantities of cold rolled sheet, bars, pipe and tubing, various shapes or profiles, plates, cold finished bars, and tubes.

Table 6

Production of Selected Ferrous Metals and the Share Required
for Production of Automobiles in the USSR ^a
1965, 1970, and 1975

	1965		1970		1975	
	Ferrous Metal Pro- duction (Million Metric Tons)	Share Required for Auto- mobile Pro- duction (Percent)	Ferrous Metal Pro- duction (Million Metric Tons)	Share Required for Auto- mobile Pro- duction (Percent)	Ferrous Metal Pro- duction (Million Metric Tons)	Share Required for Auto- mobile Pro- duction (Percent)
Castings	16.5	0.2	24	0.4	31	0.8
Gray iron and mal- leable	12.6	0.2	17	0.4	22	0.8
Steel	3.8	0.02	6	0.03	9	0.05
Rolled steel	70.9	0.3	97 ^b	0.5	125	0.9
Cold rolled sheet ...	3.6	3.3	7	4.5	12	6.7

^a Excluding production of spare parts. Because of rounding, components may not add to the totals shown.

^b Midpoint of the range of 95 million to 99 million tons.

The USSR has encountered particular difficulty in expanding the output of cold finished steel products. Soviet production of 3.6 million tons* of cold rolled sheet in 1965 was far less than the target figure of 6.5 million tons. Because of the lag in the production of cold rolled steel, the USSR has been negotiating since mid-1965 with manufacturers of metallurgical equipment in several Western countries to buy a cold rolled sheet plant. One possible transaction, estimated at about \$190 million,** calls for the annual production of 600,000 to 800,000 tons of cold rolled steel—enough steel for 1 million automobiles and several million washing machines and refrigerators. Such a plant would increase Soviet production of cold rolled steel by 17 to

* Tonnages are given in metric tons.

** Including the cost of equipment to roll tin plate and galvanized sheet and estimated building costs.

22 percent. The USSR has manufactured several continuous cold rolling mills, but the mills are much less advanced technologically than those available in the industrial West. The USSR recognizes that Western builders could supply a technologically superior cold rolling mill at less cost and with less delay than could Soviet industry.

C. MACHINE TOOLS

The need of the Soviet automobile industry for dependable high-performance specialized machinery is a key reason why the USSR has turned to the industrial West to equip its new plant. Soviet machine tool builders have always emphasized long production runs of general-purpose machine tools that are often used instead of more expensive specialized machine tools in Soviet industry. Consequently, the USSR has inadequate capacity for manufacturing complex, specialized, and highly precise machine tools. In addition, the USSR recognizes the absolute cost and quality advantages that the industrial West has in the production of automotive machine tools. The USSR, however, can be expected to produce domestically most of the required equipment of a nonspecialized nature for its expanding automobile industry.

As more automobiles are produced, specialized machinery will be needed for continuing new investment, replacement, and automotive support industries, and, therefore, it will become more profitable for the USSR to produce domestically more of the specialized equipment required by its automobile industry. Thus expanded automobile output probably will have a greater effect on the Soviet machine tool industry after 1970.

D. TIRES

The new five-year plan for tire production in the USSR calls for a production increase by 1970 roughly equivalent to the increase achieved in the seven-year period 1959-65. Output of tires (26.4 million in 1965) is scheduled to rise to between 38 million and 40 million by 1970. Automobile tires will probably account for a growing percentage of total tire output—the estimated production for 1966 and 1970 compared with 1960 follows:

	Million Units
1960	2.2
1966	4.0
1970	7.0

At least four new Soviet tire plants are to be built in 1966-70, and a number of existing plants are to be expanded. The capacities of the new plants will be on the order of 2 million to 3 million tires each, although at least some of these plants will not reach full operation until after 1970.

The increase in tire plant capacity will cost about \$40 million. Additional supporting investment in carbon black, tire cord, and synthetic rubber production could boost total investment \$100 million more for 1966-70.

E. GASOLINE

The additional requirements for motor gasoline through 1975 will place no special burden on the petroleum industry, which by 1975 may be outproducing the United States in crude oil. The industry, however, will have to emphasize more the production of gasoline in the higher octane ranges—72 octane and above. At present, the USSR produces about 5 million tons per year of such gasoline—17 percent of the total gasoline yield. If the production of crude oil continues to grow through 1975 at the rate planned for the next five years, as much as 75 million tons of motor gasoline may be produced in 1975, of which about 37 million tons could be of high octane. By contrast, the additional automobiles that are to be on the road in 1975 (excluding trucks and buses) will need only about 4 million tons per year of high-octane gasoline.

One refinery with a capacity of 12 million tons could produce the required 4 million tons if oriented toward that goal. Such a refinery might cost between \$290 million and \$360 million, of which no more than \$100 million would be assigned to provide the facilities required to produce the high-octane gasoline.

VI. Tertiary Investment

A. USSR

1. Introduction

The USSR will almost certainly have no desire and little need to duplicate in the foreseeable future the heavy tertiary investments that have been fostered by the automobile in Western Europe and the United States. Plans thus far released for the period through 1970 indicate that Moscow has felt under no compulsion to accelerate basic highway construction, much less construction of service stations and motels. Soviet planners have long believed that a well-developed railroad system best suited the USSR's needs for hauling freight. Almost all large industrial plants in the USSR are served by railroad sidings that provide door-to-door rail service. Trucks have been used in the USSR primarily for short-haul intracity shipments, and no change in this pattern is discernible.

2. Highways

As a result of the emphasis on railroads and the vast size of the country, only a rudimentary highway network exists in the USSR. Of 1,340,000 kilometers of roads in 1964, only about 350,000 kilometers, or about one-fourth, was surfaced in any way, and less than 120,000 kilometers, about 9 percent, was paved with concrete or asphalt. The length of paved roads in the USSR about equals the paved highway system in the state of Michigan. The historic backwardness of the Soviet highway system is illustrated in Table 7, which compares the length of Soviet and US highways for selected years.

During 1960-64 about 20,100 kilometers of surfaced highways, including 10,600 kilometers of paved highways, were built annually in the USSR. By contrast, the United States built over 32,000 kilometers of major (Federally-aided) highways in 1964.

As shown in Figure 3, Soviet highway construction has not accelerated in recent years, and no dramatic changes are expected in the expansion of the Soviet highway network during 1966-70. The new five-year plan (1966-70) calls for the construction of 63,000 kilometers of paved roads, an increase of about 20 percent over the length of roads constructed in the five-year period 1960-64. There will be some increased emphasis on construction and reconstruction of badly

Table 7

Length of Highways in the USSR and the United States
1940, 1950, and 1960-64

	USSR ^a				United States ^b		
	Thousand Kilometers		Percent Surfaced ^c	Percent Surfaced	Thousand Kilometers		Percent Surfaced
	Surfaced ^c						
	Total ^d	Total			Total	Surfaced	
1940	1,531	143	7	9	4,855	2,200	45
1950	1,550	177	19	11	5,322	3,121	59
1960	1,366	271	77	20	5,707	4,147	73
1961	1,336	290	87	22	5,750	4,165	72
1962	1,336	311	97	23	5,794	4,260	74
1963	1,332	330	108	25	5,826	4,334	74
1964	1,340	352	118	26	5,864	4,394	75

^a Public roads under jurisdiction of highway departments.

^b Rural, state, municipal, and county roads.

^c Including gravel surfaced roads.

^d The reduction in the total is due to decreased importance of some dirt roads.

needed rural (farm-to-market and railhead) roads. Some important intercity highways will be completed or improved during 1966-70, including the Moscow-Bryansk-Kiev highway, the Moscow-Tambov-Volgograd highway, and the Moscow-Kuybyshev-Ufa highway. Most of Central Siberia and the Far East, except for short stretches in the vicinity of the major population centers, will remain completely without a system of paved roads.

Despite the secondary importance of highways in the USSR, the vastness of the country, combined with the past neglect of the highway system, means that significant investment allocations are required even for a fairly minimal expansion effort. This conclusion is supported by the following estimates of the annual cost of new construction in the USSR for 1966-70:

	Annual Cost (Million US \$)
Paved	840
Other hard surfaced highways	400
<i>Total</i>	<i>1,240</i>

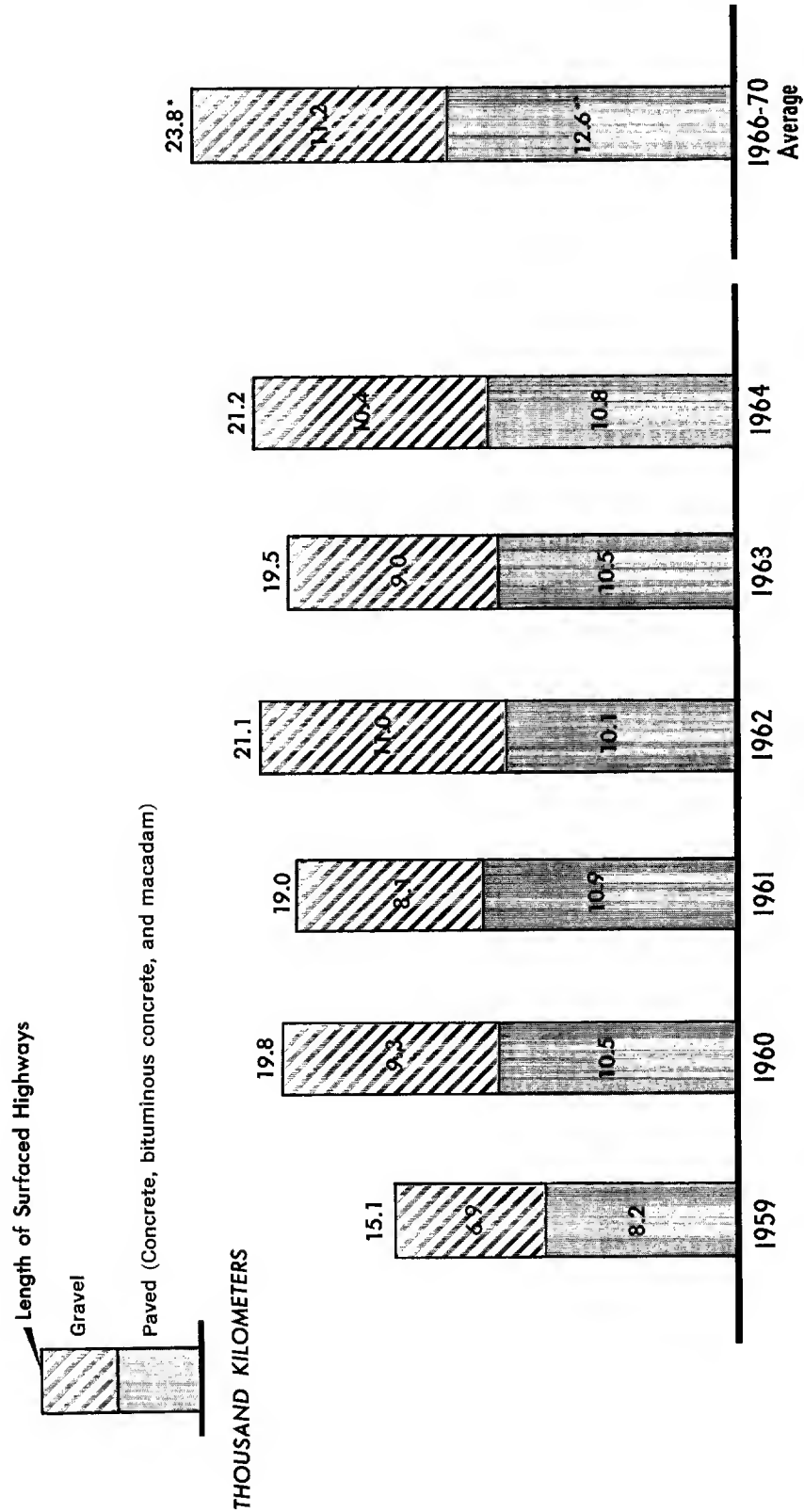
By contrast the United States awarded \$5.04 billion in contracts for new highway construction in 1965, and contracts for 1966 will total approximately \$6 billion.

3. Service Stations and Garages

Automotive service facilities in the USSR are woefully inadequate, nor is there any indication that the regime intends to improve this situation in the immediate years ahead. In Moscow there are eight

Figure 3

USSR: CONSTRUCTION OF SURFACED HIGHWAYS 1959-64 and 1966-70 Average



*Estimated on the basis of the past relationship between surfaced roads and paved roads (1959-64 average).

**Planned

gasoline stations and eight garages, only three of which service all makes of Soviet automobiles. In Leningrad there are three gasoline stations and only one garage. Outside the major cities, service stations and garages are even harder to find, as shown in the tabulation below:

Route	Distance (Kilometers)	Gasoline Stations	Garages
Moscow-Minsk	705	5	1
Moscow-Leningrad	724	5	2
Moscow-Khar'kov	734	7	2
Moscow-Gor'kiy	995	3	0
Khar'kov-Kiev	478	3	1
Moscow-Kalinin	161	0	0

In contrast to the 211,000 gasoline stations in the United States, which perform necessary economic functions, especially with respect to maintenance and repair, the total number of stations in the USSR in 1963 was 1,500 to 1,600. If the present ratio of automobiles to filling stations is maintained, during 1966-75 the USSR would have to build additional filling stations,* as indicated in the following tabulation:

		Thousand US \$	
		Equipment	
	Number	Cost	Total Cost
1966-70	1,300	6,500	22,100
1971-75	4,800	24,000	81,600
<i>Total</i>	<i>6,100</i>	<i>30,500</i>	<i>103,700</i>

The USSR has not announced any plans for expanding repair facilities, but some indication that the plans are quite modest in scope was suggested by a recent news item in a Moscow newspaper which stated that during the next five years two service facilities, each capable of handling 12,000 vehicles annually, will be built. In addition, an unspecified number of other repair facilities will be built, with a total capacity of only 72,000 vehicles annually. The following tabulation gives estimates of the additional number of garages likely to be built in the next 10 years**:

		Thousand US \$	
		Equipment	
	Number	Cost	Total Cost
1966-70	430	4,300	15,000
1971-75	1,600	16,000	56,000
<i>Total</i>	<i>2,030</i>	<i>20,300</i>	<i>71,000</i>

* Estimated from the ratio of automobiles in use (844,100) to service stations (between 1,500 and 1,600) in 1963.

** Estimated from the ratio (1 to 3) of garages to service stations in the USSR in 1962.

4. Social Considerations

Apart from these strictly economic considerations there are other reasons for expecting the Soviet regime to move cautiously in encouraging investments that would promote the expanded use of automobiles beyond the city limits. For example, the USSR is one of the most security conscious nations in the world and the movements of its citizens are carefully monitored through a system of police registrations. The regime probably would not be willing to accept the economic and political costs of expanding such a system to manage the major increase in mobility that would certainly follow an unrestricted expansion of the facilities for long-distance travel. No matter how appealing the prospect of suburban and rural living is to the Soviet urbanite, presently confined to an inadequate city apartment, the regime may be expected to resist a proliferation of private rural housing as both costly and poorly suited to the Soviet conception of the social needs of its citizens.

B. THE EXPERIENCE OF THE UNITED STATES AND WESTERN EUROPE

1. The United States

The Soviet planner, even though intellectually committed to increasing the importance of the automobile in the USSR, must look with considerable trepidation at data that show how the US economy was revamped by mass production and use of the automobile. After the United States took to wheels, there was a vast inner migration which led to modern multilaned highways, vast suburbs, and more and more consumer durables. To support 82 million motor vehicles (69 million automobiles and 13 million trucks and buses) in 1963, the United States had the following:

	Number	Sales (Billion US \$)
Automotive wholesalers *	22,883	6.7
Franchised automobile dealers	33,349	37.4
Automotive repair	114,459	3.6
Gasoline service stations	211,473	17.7

* A wholesale distributor of automobile parts—from tires to engine blocks.

It should be borne in mind, however, that the enormous investment in superhighways and sprawling suburbs in the United States today was not a feature of the US automotive history during 1910-20—the time period most analogous to the present Soviet position (Phase A in Figure 4). The mass-production age of automobiles began in the United States in about 1910 (181,000 automobiles were produced during that year). By 1912 the stock of automobiles totaled close to

a million, about the same as the Soviet inventory today. By 1917 the US stock had grown to 4.7 million automobiles; the USSR probably will need 10 more years to increase its inventory by this amount. In the 1910-20 period the US stock of automobiles increased annually by an average of 33 percent, but total highway expenditures and the total length of surfaced highways increased much more slowly (see Figure 5). Total expenditures on roads increased 9 percent annually and the length of surfaced highways 6 percent.

Highway construction in the United States has long received an impetus from the growing requirements for both passenger and freight traffic. The early urban car owner in the United States was anxious to drive into the countryside, and the farmer pressed for farm-to-market roads. But it was not until about 1946 that the United States, having a stock of nearly 30 million automobiles and having been released from the pressures of war and depression, substantially accelerated tertiary investment and entered the Phase C of the automobile age, as described in Figure 4. The long-run relationship between the stock of automobiles and highway expenditures in the United States is shown in Figure 6.

More specifically, not until 25 years after the United States had left Phase A—the phase that the USSR is just now entering—did the US automotive age finally induce greater increases in service facilities, superhighways, modern motels, supermarkets, shopping plazas, and the mass migration to the suburbs. Although the dispersal of the population from the central city has been underway in the United States since the turn of the century, the major trend toward suburban development has taken place since World War II. In the last decade, more than three-quarters of the new dwelling units, measured by value or number, in the major metropolitan areas were constructed outside the central cities.

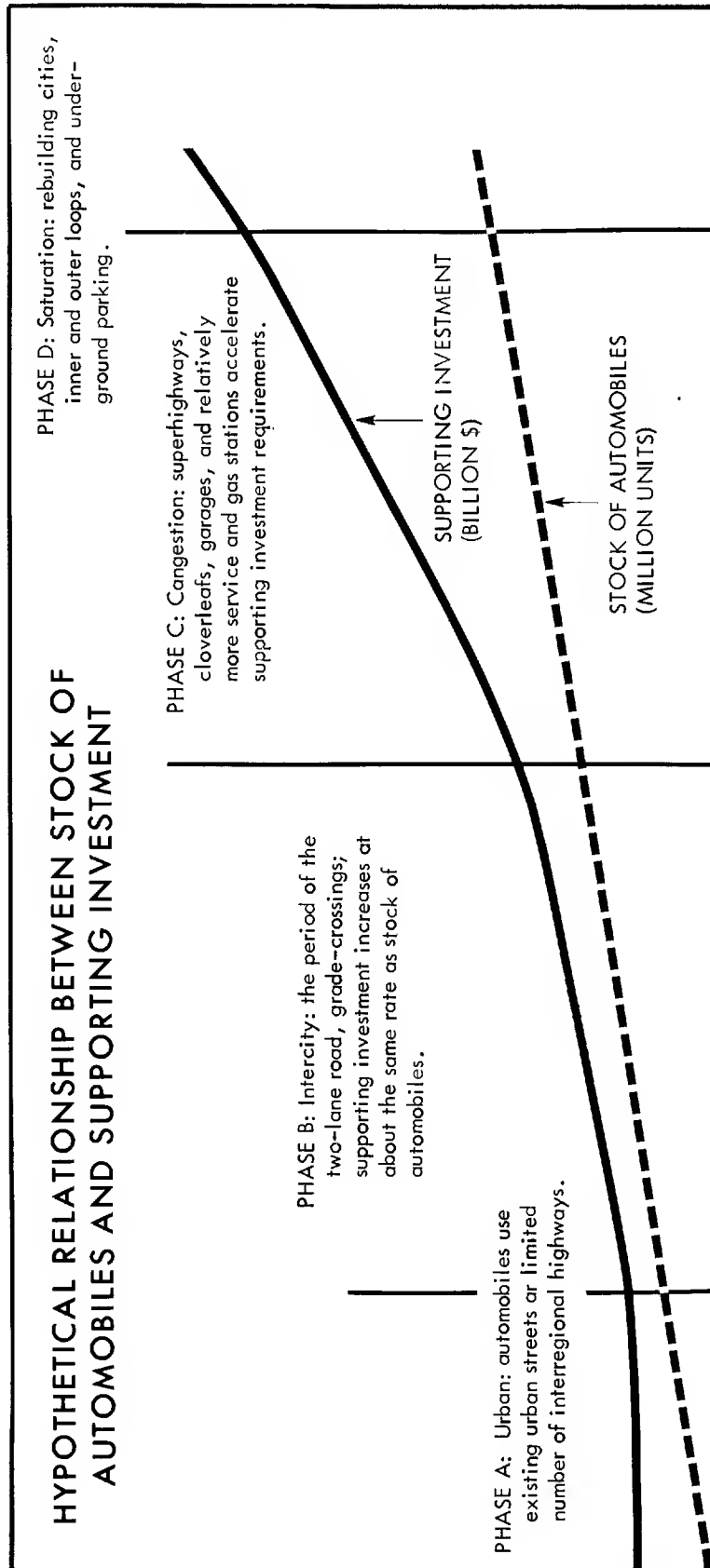
2. Western Europe

Western Europe, which had only a motorbike toehold in the automotive age in the early 1950's, has in recent years become a full member with all attendant pleasures and problems. Both production and stock have increased rapidly, as shown in the tabulation below:

	Million Automobiles	
	Production	Stock
1950	1.1	6.0
1962	6.7	27.8
1964	7.0	35.1

The annual rate of growth of the stock of automobiles in Western Europe has averaged 13 percent from 1950 through 1964, a higher

Figure 4



YEARS

The overall shape of the supporting investment curve will be dependent on the total area and population of the country, its geography, and distribution of automobiles between rural and urban ownership. Present Soviet plans still place the USSR within PHASE A. Western Europe is entering PHASE C. The US as a whole is within PHASE C, but parts of the East Coast of the US are within PHASE D.

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UNITED STATES AND WESTERN EUROPE: COMPARATIVE INDEXES OF AUTOMOBILE STOCK AND HIGHWAY EXPENDITURES

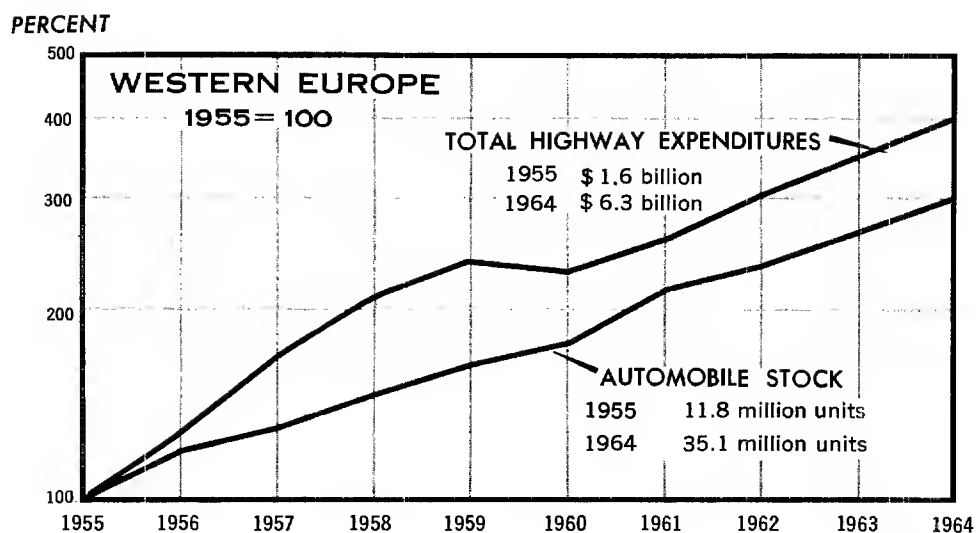
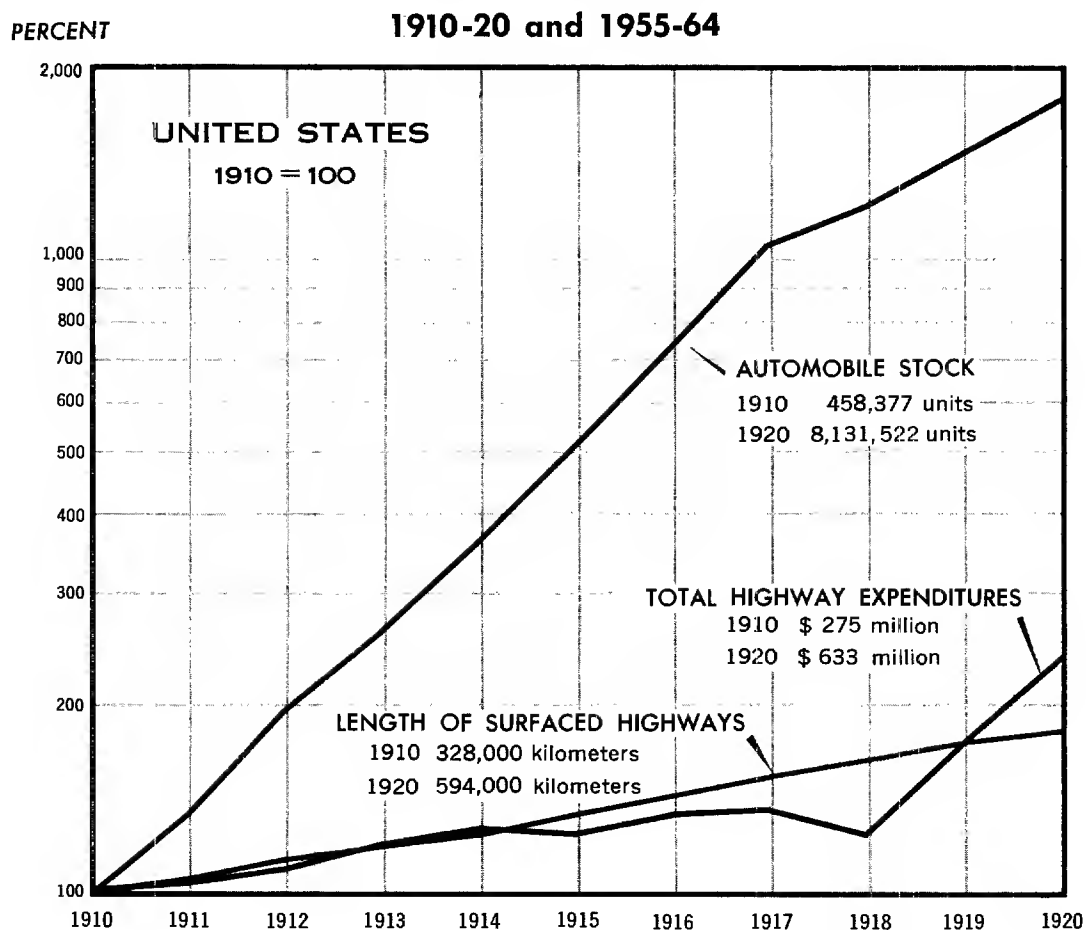
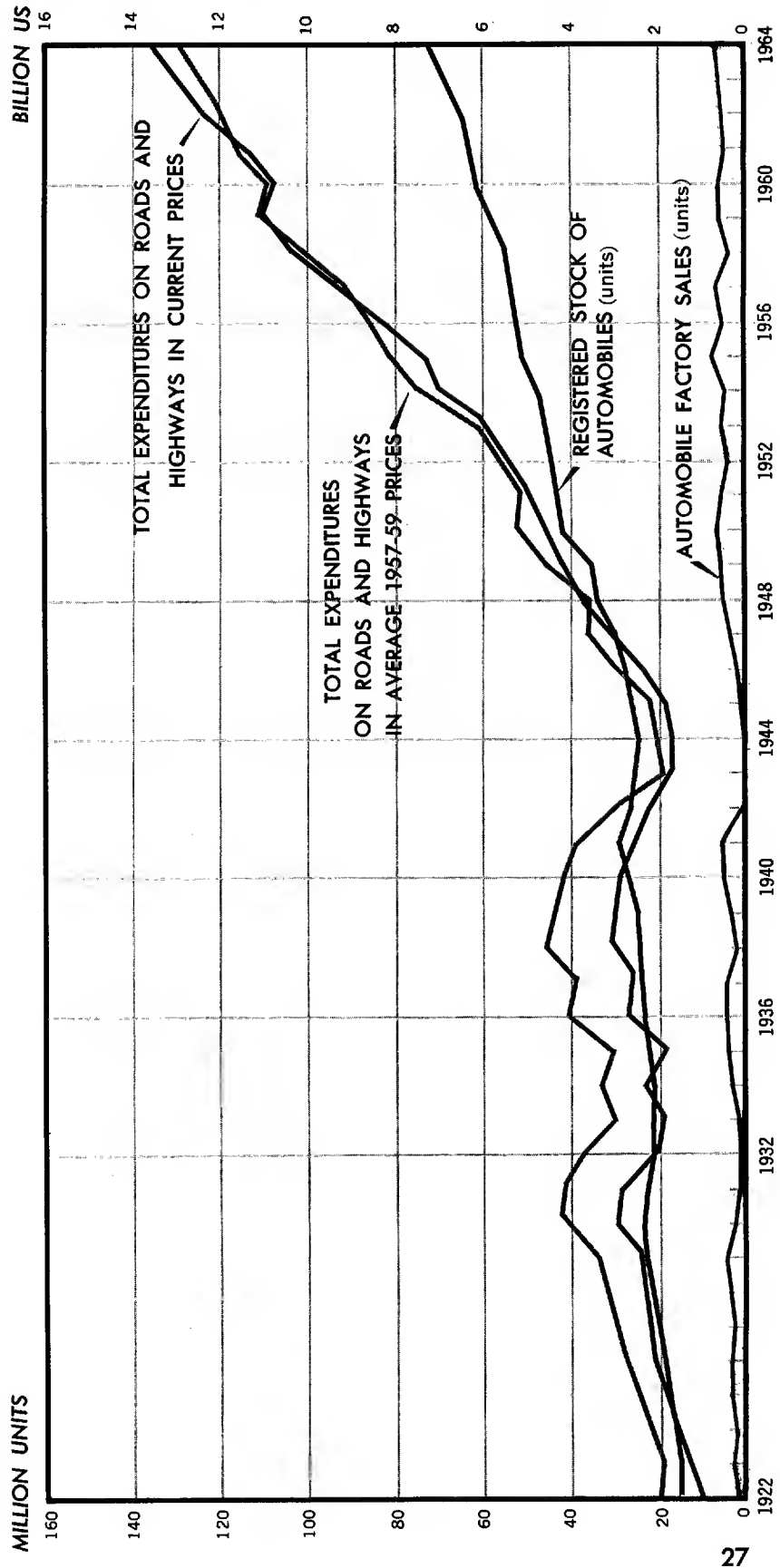


Figure 6

UNITED STATES: ANNUAL PRODUCTION AND STOCK OF AUTOMOBILES AND HIGHWAY EXPENDITURES, 1922-64



growth rate than GNP, which rose at an average annual rate of about 9 percent (in current terms).

In the past decade Western Europe has devoted, as shown in the tabulation below, an increasing share of its resources to the development of roads and highways.

	Total Highway Expenditures (Billion US \$)	Percent of GNP
1956	2.0	0.8
1964	6.3	1.4
1970	9.7 *	2.0

* Estimated by the International Road Federation.

Yet, despite the rapid increase in highway expenditures in Western Europe and the present existence of about 5 million kilometers of roads, the present highway system is considered inadequate for the traffic it must bear. The turnpike or thruway is virtually unknown in Europe outside Germany. In France in 1964 there were only 348 kilometers of such superhighways. The heavy investments in bypasses, free-ways, and beltways are yet to be borne by most of the countries of Western Europe. As shown above, Western European highway expenditures as a share of GNP have increased but are still significantly lower than in the United States.*

Western European experience indicates, as does US experience, that a widespread increase in automobile ownership eventually induces large amounts of other tertiary investments. Much of this investment—restaurants, motels, service stations, and shopping centers—caters to the increased mobility given the population by the automobile. Much of the investment in public works—cloverleaves, turnpikes, and freeways—is required when the density of automobile traffic threatens to destroy the very mobility that the automobile has introduced. The United States today is becoming increasingly aware of the major investments and revamping of cities and countrysides that are needed to live with the automobile. Western Europe is well into the automobile age, entering Phase C (see Figures 4 and 5), but has not yet completely faced up to the heavy investments needed to live with the automobile.

Ultimately the Soviet economy may have to pay the costs—the super-highways and underground parking—of enjoying the convenience of the automobile. Western experience, however, shows that it will be decades before the automotive expansion forces the Soviet economy to cater to the induced investment engendered by the automobile rather than the preferences of the hierarchy.

* By contrast, highway expenditures in the United States for the past decade have consistently been about 2.2 percent of GNP.

APPENDIX

ESTIMATED COSTS OF BUILDINGS AND EQUIPMENT OF THE FIAT PLANT

Facility and Types of Equipment	Area (Million Square Feet)	Cost of Building (Million US \$)	Cost of Equipment (Million US \$)
Press shop: 25 major press lines, 150 small and intermediate press units	0.75	25	50
Subassembly and body construction plant: welding equipment and booths, transformers, fixtures, and the like	1.1	20	20
Assembly plant: conveyors, spray booths, ovens, body phosphate equipment, dynamometers, pneumatic hand tools, and the like	2.1	35	40
Soft trim plant: equipment for cutting and sewing cloth and vinyl	0.5	7.5	7.5
Engine plant: 2 transfer lines each for head and block, 3 transfer lines for crankshaft, 30 camshaft grinders, other single and multipurpose machine tools for pistons, rods, pins, and other engine parts	0.6	17	33
Foundry: all cast parts, 600 tons per day	0.5	10	20
Transmission, drive shaft, front suspension, axle, and steering plant: 2 transfer lines each for transmission case and axle, automatic assembly lines, conveyor lines, washers, degreasers, and automatic machine tools for gears and other parts	1.3	21	44
Wheel and bumper manufacturing and plating plant: two press lines for bumpers, one plating line, and wheel forming presses	0.25	5	11
Glass plant: complete facilities to manufacture automobile window glass—glass furnaces and rolling and cutting equipment	0.5	12	28
Battery plant	0.1	1.5	4.5
Starter, generator, heater, horn, carburetor, distributor, and miscellaneous electric parts plant: general and special-purpose machine tools, heat treatment furnaces, washers, degreasers, paint equipment, and conveyors	0.8	13	27
Special tooling: fixtures, dies, tooling, gauges, and the like—nearly all would have to be replaced at model change			70
<i>Total</i>	8.5	167	355